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ABSTRACT

The relationship between the Scales of Independent Behavior (SIB) and the Vineland Adaptive Behavior Scale (VABS) was investigated, with 53 children as subjects. Specifically, the study sought to examine the convergent and discriminant validities of the long forms of the SIB and the VABS and to ascertain the accuracy of classification of intellectually handicapped children using these two instruments. The subjects, aged 3 to 7, were classified as being behaviorally handicapped, communication disordered, slow learners, mildly intellectually handicapped, or moderately to severely intellectually handicapped. Analysis found evidence of convergent validity between the two instruments in the measurement of adaptive behavior. Scales measuring personal living skills exhibited excellent convergent validity and fair discriminant validity; communication skills scales exhibited good convergent validity and fair discriminant validity; and domestic skills and socialization skills scales exhibited poor convergent and poor discriminant validities. Motor skills scales had such low convergent validity that discriminant validity was not examined. Other variables critical in test selection were also examined, including administration time, interview format, interrater reliability, and the number of scales which significantly discriminate between intellectually handicapped and non-intellectually handicapped. (JDD)

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The Scale of Independent Behavior and Revised Vineland: A Comparison Study

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Abstract

This study investigated the relationship between the Scale of Independent Behavior (SIB) and the Vineland Adaptive Behavior Scale (VABS). Subjects consisted of 53 handicapped children ages 3 through 7. A correlation of .83 was found between the SIB Broad Independence score and the VABS Adaptive Behavior Composite.

The Scale of Independent Behavior and Revised Vineland: A Comparison Study

A quarter-century ago the American Association on Mental Deficiency (AAMD) incorporated adaptive behavior into its definition of mental retardation. Prior to that time, adaptive behavior, or social competence as it was originally labeled by Edgar Doll (1953), was largely ignored. Only the construct of IQ was utilized by individuals conducting assessments. Three predominate trends, however, have significantly impacted the use of adaptive behavior measures in the assessment of mental retardation.

The first trend contributing to the use of adaptive behavior measures has been a broadening of the basic definition of mental retardation. The American Association on Mental Deficiency formally added the adaptive behavior component to the measurement of intelligence in the definition of mental retardation, first in the so-called "Heber Manual" (Heber, 1961) and in the subsequent 1973, 1977, and 1983 revisions of the AAMD Manual (Grossman, 1983). In the latter, the Association provides the widely adopted definition of mental retardation as "significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior." The description of adaptive behavior is defined as "the effectiveness or degree with which an individual meets the standards of personal independence and social responsibility expected for age and cultural group" (Grossman, 1977).

The second trend affecting the use of adaptive behavior measures is the current emphasis placed upon training as opposed to custodial care for handicapped individuals who are in state-supported residences and schools. As such, assessment of adaptive behavior and procedures for teaching adaptive behavior become essential for the development of independent personal and social functioning (Nirje, 1969; Leland, 1973).

The employment of formalized measures for baselines and post scores is the third trend affecting the use of adaptive behavior instruments. In this manner adaptive behavior measures are used as baselines and post scores for assessing individual adaptive behavior progress and program effectiveness in social domains.

The formal beginnings of adaptive behavior measurement was Doll's work in the development of the Vineland Social Maturity Scale (Doll, 1947). Since then, there has been a proliferation of adaptive behavior instruments for diagnosis and placement, for identification of areas for program training, planning, and evaluation. Two recent instruments are the Scales of Independent Behavior (SIB) and the revised Vineland Adaptive Behavior Scales - Interview Edition, Expanded Form (VABS). As both instruments purport to measure similar behaviors, it is of interest to know what differences exist and how these differences affect identification and classification of children.

The purposes of the present study were to examine the convergent and discriminant validities of the long forms of the SIB and the VABS and to ascertain the accuracy of classification of intellectually handicapped children using these two instruments.

Method

Instruments

The VABS provides norms from birth to 18 years, 11 months and uses a conversational data-gathering format between the examiner and a knowledgeable adult, such as a parent or caregiver. It contains four major domains: Motor Skills (to age 6, with Gross and Fine subdomains), Communication (with Receptive, Expressive, and Written subdomains), Socialization (with Interpersonal Relationships, Play and Leisure Time, and Coping Skill subdomains), and Daily Living Skills (with Personal, Domestic, and Community subdomains). The Adaptive Behavior Composite, an overall performance score, is derived by administering and combining information from all 11 adaptive behavior subdomains.

The SIB provides norms from infancy to adulthood (age 40 years and above). The examiner individually administers a structured interview to an informed respondent, such as a parent or caregiver. The SIB contains four major clusters: Motor Skills (with Gross and Fine subscales), Social Interaction and Communication (with Social Interaction, Language Comprehension and Language Expression subscales), Personal Living Skills (with Eating, Toileting, Dressing, Self-Care and Domestic subscales) and Community Living (with Time and Punctuality, Money and Value, Work Skills, and Home and Community Orientation subscales). The full scale Broad Independence score is derived by administering and combining information from all 14 adaptive behavior subscales.

Subjects

The sample consisted of 53 subjects ages 3 through 7. One subject was classified behaviorally handicapped, 5 were identified as communication disordered, 8 were slow learners, 16 were mildly intellectually handicapped, and 23 were moderately to severely intellectually handicapped.

Subjects were obtained from referrals for evaluation or randomly selected from self-contained classrooms in a middle-class suburban community in the Western United States. Both instruments were administered to the mothers of each subject by 2 of 3 trained school evaluators within a 2-day period. The administration order was counter balanced across subjects and across examiners. Scores were verified by a second test examiner.

Procedure

A correlation matrix of the scales on both tests was calculated and examined for redundancy of scales within tests. On the basis of this examination it was suspected that some scores could be combined without loss of information. To test this hypothesis, five factor analyses were performed using Kaiser's Second Generation Little Jiffy (1970).

For motor skills, the two VABS motor scales (Gross and Fine) and the two SIB motor scales (Gross and Fine) were factored. Only one significant factor emerged, the first two unaltered Eigenvalues being 2.74 and 0.91. For this reason, subsequent analysis dealt only with total Motor Skills.

For socialization skills, the three VABS scales (Interpersonal, Play and Leisure, and Coping) and the SIB Social Interaction scale were factored. Again, only one significant factor was found, the first two Eigenvalues being 3.22 and 0.40. Subsequent analysis combined the three VABS scales into one scale identified as Socialization Skills.

For communication skills, the two VABS communication scales (Receptive Language and Expressive Language) and the two SIB communication scales (Language Comprehension and Language Expression) were factored. Only one significant factor was found, the first two Eigenvalues being 3.21 and 0.49. Subsequent analysis combined the two scales into one scale on each test identified as Communication Skills.

For personal living skills, the VABS Personal scale and four of the SIB Personal Living Skills scales (Eating, Toileting, Dressing, and Self-Care) were factored. Only one significant factor was found, the first two Eigenvalues being 4.09 and 0.41. Subsequent analysis combined the four SIB scales into one scale identified as Personal Living Skills.

For community living skills, the VABS Community scale and the four SIB Community Living scales (Time and Punctuality, Money and Value, Work Skills, and Home and Community Orientation) were factored as above and only one significant factor emerged, the first two Eigenvalues being 3.70 and 0.56. Subsequent analysis combined the four SIB scales into one scale identified as Community Living Skills.

After combining the scores for the scales discussed above, a new correlation matrix was computed and examined for evidence of convergent and discriminant validity.

In order to estimate the accuracy of each test in identifying intellectually handicapped individuals, two step-wise discriminate function analysis were performed. First, intelligence test scores were used to classify subjects into two groups: intellectually handicapped, having IQs of less than 70; and non-intellectually handicapped, having IQs of 70 or above. A discriminant function analysis was then performed for each test.

Results

The index of convergent validity is the correlation between corresponding traits on two tests. These are found in the principle diagonal of the heterotrait-heteromethod block displayed in Table 1.

Insert Table 1 about here

In decreasing magnitude, these are:

	Variable	r
1.	Personal Living Skills	.95
2.	Communication Skills	.92
3.	Community Living Skills	.88
4.	Domestic Skills	.76
5.	Socialization Skills	.76
6.	Motor Skills	.50

It can be seen that the convergent validity of Personal Living Skills and Communication Skills are excellent, the validity of Communication is good, Domestic Skills and Socialization are poor, with Motor Skills below

standard. Since the VABS Motor Skills scale correlates .71 with the SIB Personal Living Skills and .59 with the SIB Domestic Skills, it seems likely that the VABS and the SIB Motor scales measure somewhat different traits.

One criterion of discriminant validity (Cambell & Fiske, 1959) is that each value in the principle diagonal of the heterotrait-heteromethod block be larger than any other value in the corresponding row or column. This is the case for Personal Living Skills and Communication Skills. For these two scales, some of the differences are small but in the desired direction. Community Living Skills fails the criterion because of a higher off-diagonal correlation with Communication Skills. Domestic Skills fails the criterion because of higher off-diagonal correlations in the areas of Personal Living Skills and Community Skills. Socialization Skills fails the criterion because the VABS Socialization scale correlates less well with the SIB Communication and SIB Community scale.

A second criterion of discriminant validity is that each convergent index should be larger than any value in the corresponding row or column of the heterotrait-monomethod triangle. It can be seen that Personal Living Skills meets this criterion because the convergent validity index between the two measures of Personal Living Skills (.95) of the SIB and VABS is greater than the correlations of Personal Living Skills with any other scales within the two tests. Communication Skills and Community Living Skills also meet this criterion. These are the three scales with the best convergent validity. For the Socialization scales the convergent validity coefficient is .76. Turning to the VABS heterotrait-

monomethod triangle, it can be seen that three out of four measures were higher than the convergent validity coefficient. However, in examining the SIB Socialization scales, .76 exceeds all four other measures. Therefore, Socialization fails to meet this criterion because of the VABS failure to discriminate between abilities measured by different subtests. Examination of Domestic Skills (convergent validity = .76) on the SIB heterotrait-monomethod triangle indicates that the criterion is failed for Community Living Skills. On the VABS heterotrait-monomethod triangle, the criterion is failed for both Personal Living Skills and Community Living Skills.

Cambell & Fiske's final criterion for discriminant validity is that there should be a similarity of patterns between trait interrelationships in the heterotrait-monomethod triangles. The relatively high intercorrelations between scales on the VABS ensures that this criterion will not be met.

In summary, Personal Living Skills scales exhibit excellent convergent validity and fair discriminant validity; the Communication Skills scales exhibit good convergent validity and fair discriminant validity; the Domestic Skills and Socialization Skills scales exhibit poor convergent and poor discriminant validities. The Motor Skills scales have such low convergent validity that discriminant validity was not examined.

In order to determine which variables or combination of variables would best discriminate between intellectually handicapped and non-intellectually handicapped subjects, two stepwise discriminant

function analyses were performed. The results for the VABS indicated three scales discriminated significantly ($p < .05$) between the two populations:

1. Personal Living Skills F (1, 31) = 5.88
2. Gross Motor Skills F (1, 31) = 5.87
3. Expressive Language F (1, 31) = 5.65

It was also found that, because of correlations between the predictors, if any of the three were used at the first step, none of the residuals were significant. Using the discriminant function it was found that the VABS misclassified 3 subjects as handicapped when nonhandicapped and 8 subjects as nonhandicapped when handicapped.

The results from the SIB indicated the Domestic Living Skills was much the best discriminant although nine other scales discriminated significantly ($p < .05$) between the populations.

The significant discriminants were:

1. Domestic Skills F (1, 31) = 12.74
2. Work Skills F (1, 31) = 9.96
3. Dressing F (1, 31) = 8.50
4. Eating F (1, 31) = 7.34
5. Language Expression F (1, 31) = 7.21
6. Time and Punctuality F (1, 31) = 7.10
7. Self-Care F (1, 31) = 6.90
8. Money and Value F (1, 31) = 6.06
9. Home and Community F (1, 31) = 5.87
10. Toileting F (1, 31) = 4.61

As was found for the VABS, after the removal of variance for the best discriminant, none of the residuals were significant Using the discriminant function it was found that the SIB misclassified 2 subjects as handicapped when nonhandicapped and 14 subjects as nonhandicapped when handicapped..

Discussion and Conclusions

The current study investigated the convergent and discriminant validities of the SIB and VABS. The general measures of adaptive behavior identified as Broad Independence on the SIB and the Adaptive Behavior Composite on the VABS correlated .83. There is evidence of convergent validity between the two instruments in the measurement of adaptive behavior. As these two instruments are similar, other variables become critical in test selection for the practitioner. From a practical view, time and ease of administration become a primary consideration. The administration time ranges from 45-60 minutes for the SIB whereas administration time for the VABS ranges from 60-90 minutes. The SIB provides a structured interview format; the VABS is administered through a semi-structured interview. Perhaps because of the unstructured format, the VABS obtained an inter-rater reliability of .74 compared to .99 for the SIB.

Both tests have some scales with fair convergent and discriminant validity for purposes of identification of intellectually handicapped. The SIB appears to be the stronger test because there are 10 scales which significantly discriminate between intellectually handicapped and non-intellectually handicapped. In the case of the VABS, there are three

scales which significantly discriminate between intellectually handicapped and non-intellectually handicapped.

From this limited study, it is suggested that future research consider other populations and larger sample size. It would be beneficial to use a third adaptive behavior instrument.

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Author Notes

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Table 1

Correlations Between VABS Domains and Subdomains and SIB Clusters and Subscales: 3 to 7 Years (N = 53)

Instrument	Vineland[a]						SIB[a]					
	1	2	3	4	5	6	1	2	3	4	5	6
Vineland												
Motor	1.00											
Socialization	0.27	1.00										
Communication	0.25	0.85	1.00									
Domestic	0.44	0.79	0.73	1.00								
Personal	0.70	0.73	0.70	0.82	1.00							
Community	0.22	0.85	0.77	0.79	0.73	1.00						
SIB												
Motor	0.50	0.31	0.22	0.35	0.49	0.33	1.00					
Socialization	0.31	0.76	0.67	0.58	0.53	0.55	0.29	1.00				
Communication	0.25	0.82	0.92	0.74	0.74	0.75	0.23	0.72	1.00			
Domestic	0.59	0.67	0.66	0.76	0.83	0.63	0.33	0.58	0.72	1.00		
Personal	0.71	0.65	0.63	0.77	0.95	0.69	0.49	0.52	0.70	0.83	1.00	
Community	0.35	0.84	0.90	0.81	0.79	0.88	0.34	0.65	0.87	0.73	0.77	1.00

[a] = 1 = Motor; 2 = Socialization; 3 = Communication; 4 = Domestic; 5 = Personal; 6 = Community.

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